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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

GEYER, SCOTT B

ART UNIT

PAPER NUMBER

2829

DATE MAILED: 01 22 2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/920,275

Applicant(s)

CHRYSLER ET AL.

Examiner

Scott B. Geyer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 26 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1,2,4,5,7-17 and 25-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 8-11 is/are allowed.
- 6) ☐ Claim(s) 1,2,4,5,7,12-17 and 25-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 12 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The specification as amended by the applicant is acceptable.

Claim Objections

2. Claims 13 and 17 as amended by the applicant are acceptable. Claims 3 and 20 have been canceled by the applicant.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 15 recites a layer of polysilicon on the layer of monocrystalline silicon, the layer of monocrystalline silicon being located on the layer of polysilicon". It is unclear from the claim language as to whether the layer of polysilicon is on top of the layer of monocrystalline or beneath the layer of monocrystalline silicon. This claim has not been treated further on its merits.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 2, 4 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanabe et al. (6,051,063).

As to **claim 1**, Tanabe et al. teach a wafer consisting of a layer of diamond on a monocrystalline silicon semiconductor material (column 4, lines 34-49). Further, Tanabe et al. teach silicon wafers with a plurality of electronic devices (integrated circuits) (column 2, lines 7-22).

As to **claim 2**, Tanabe et al. teach a layer of solid diamond film with a diameter of up to 8 inches (203.2 mm) (see table 1, column 9).

As to **claim 4**, Tanabe et al. teach a single silicon crystal substrate with a diameter of up to 8 inches (203.2 mm) (see table 1, column 9).

As to **claim 5**, Tanabe et al. teach the layer of monocrystalline semiconductor material as a layer of monocrystalline silicon (Si single crystal wafer) (column 4, line 42).

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(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

7. Claim 12 is rejected under 35 U.S.C. 102(a) as being anticipated by Clevenger et al. (6,337,513 B1).

As to **claim 12**, Clevenger et al. teach a layer of solid diamond having an exposed lower surface and an integrated circuit (chip) on the layer of solid diamond as is shown in figure 3.

As to **claim 13**, Clevenger et al. teach a layer of solid diamond having an exposed lower surface and an integrated circuit (chip) on the layer of solid diamond as

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is shown in figure 3. Clevenger et al. also teach diamond formed on single crystal silicon (column 3, lines 50 et seq.).

As to **claim 14**, Clevenger et al. teach a layer of solid diamond having an exposed lower surface and an integrated circuit (chip) on the layer of solid diamond as is shown in figure 3. Clevenger et al. also teach diamond formed on single crystal silicon (emphasis added) (column 3, lines 50 et seq.).

As to **claim 16**, Clevenger et al. teach a plurality of contacts (see solder balls in figure 3).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanabe et al. (6,051,063) as applied to claim 1 above, and further in view of Nagy (5,696,665).

As to **claim 7**, Tanabe et al. does not specifically teach an integrated circuit having a plurality of contacts. However, Nagy teaches an integrated circuit with a plurality of contacts wherein the integrated circuit is located on a diamond substrate (see figure 2). At the time of the invention, it would have been obvious to a person of ordinary skill to modify the integrated circuit disclosed by Tanabe et al with a plurality of

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contacts as taught by Nagy so as to provide a means for functionality of the semiconductor device.

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10. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Clevenger et al. (6,337,513 B1) as applied to claim 12 above, and further in view of Nagy (5,696,665).

As to **claim 17**, Clevenger et al. do not specifically teach a die with a rectangular outline. However, Nagy teaches a die 11 as see in figure 2, with a rectangular outline. At the time of the invention, it would have been obvious to a person of ordinary skill to modify the chip (die) of Clevenger et al. with a rectangular shape as taught by Nagy as the rectangular shape is extremely notorious in the art of semiconductor devices and is further readily produced by dicing wafers with a saw which can easily produce rectangular, or square, shaped singulated dies.

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11. Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanabe et al. (6,051,063).

As to **claim 25**, Tanabe et al. teach a wafer consisting of a layer of diamond on a monocrystalline silicon semiconductor material (column 4, lines 34-49). Further, Tanabe et al. teach silicon wafers with a plurality of electronic devices (integrated circuits) (column 2, lines 7-22). Tanabe et al. also teach the diamond film having a thickness less than 150 microns (see table 1, column 9). Tanabe et al. does not explicitly teach a plurality of electronic devices in "rows and columns". However, it

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would have been obvious to a person of ordinary skill in the art that a 'plurality' defines two (or more) objects, and at least two objects would then necessarily define either a single row and two columns or two rows and one column, depending upon the vantage point of the two objects.

Allowable Subject Matter

12. Claims 8-11 are allowed.

13. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record and to the examiner's knowledge does not teach or render obvious, at least to the skilled artisan, the instant invention regarding a wafer wherein a final monocrystalline semiconductor film is layered on a layer of solid diamond and a layer of monocrystalline semiconductor material is layered directly on the final monocrystalline semiconductor film with a boundary defined between the final monocrystalline semiconductor film and the layer of monocrystalline semiconductor material for purposes of shearing the layer of monocrystalline semiconductor material from the final monocrystalline semiconductor film. Claims 9-11 are dependent from claim 8.

14. Claim 26 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record and to the examiner's knowledge does not teach or render obvious, at least to the skilled artisan, the instant invention regarding a layer of monocrystalline semiconductor material *between* the layer of diamond and the integrated circuit. Claim 27 is dependent upon claim 26.

Response to Arguments

15. Applicant's arguments with respect to claims 1, 2, 4, 5, 7, 12-17 and 25-27 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion


16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott B. Geyer whose telephone number is (703) 306-5866. The examiner can normally be reached on weekdays, between 10:00am - 6:30pm. The examiner may also be reached via e-mail: scott.geyer@uspto.gov

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (703) 308-1233. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

S.B.G.

S.B.G.
January 14, 2003


KAMAND CUNEO
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